US009248783B2

(12) **United States Patent**
Thom et al.

(10) **Patent No.: US 9,248,783 B2**
(45) **Date of Patent: Feb. 2, 2016**

(54) **STABILIZING CARGO ORGANIZER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 170 days.

(21) Appl. No.: **14/068,782**

(22) Filed: **Oct. 31, 2013**

(65) **Prior Publication Data**

US 2014/0054345 A1 Feb. 27, 2014

(51) **Int. Cl.**
B60R 7/00 (2006.01)
B60R 7/02 (2006.01)

(52) **U.S. Cl.**
CPC ***B60R 7/02*** (2013.01)

(58) **Field of Classification Search**
CPC B60R 7/02; B60R 7/00
See application file for complete search history.

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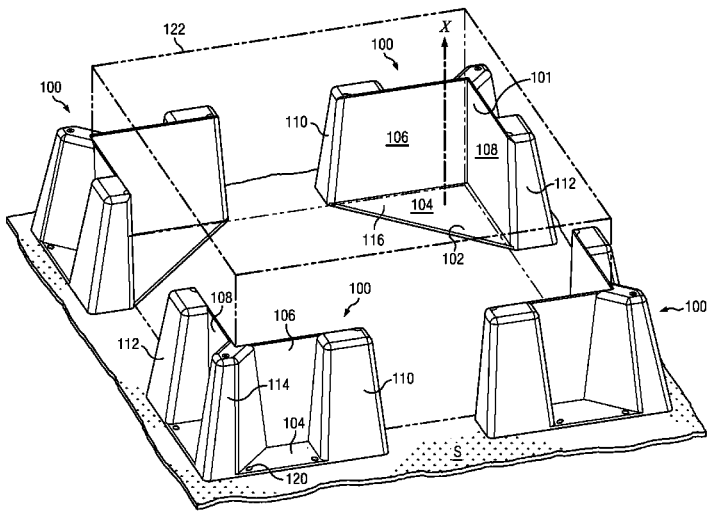
(57) **ABSTRACT**

Cargo organizers may be used for various sized boxes and packages. A friction pad overmolded on a bottom panel of the organizer body prevents movement when the cargo is transported in a vehicle.

18 Claims, 6 Drawing Sheets



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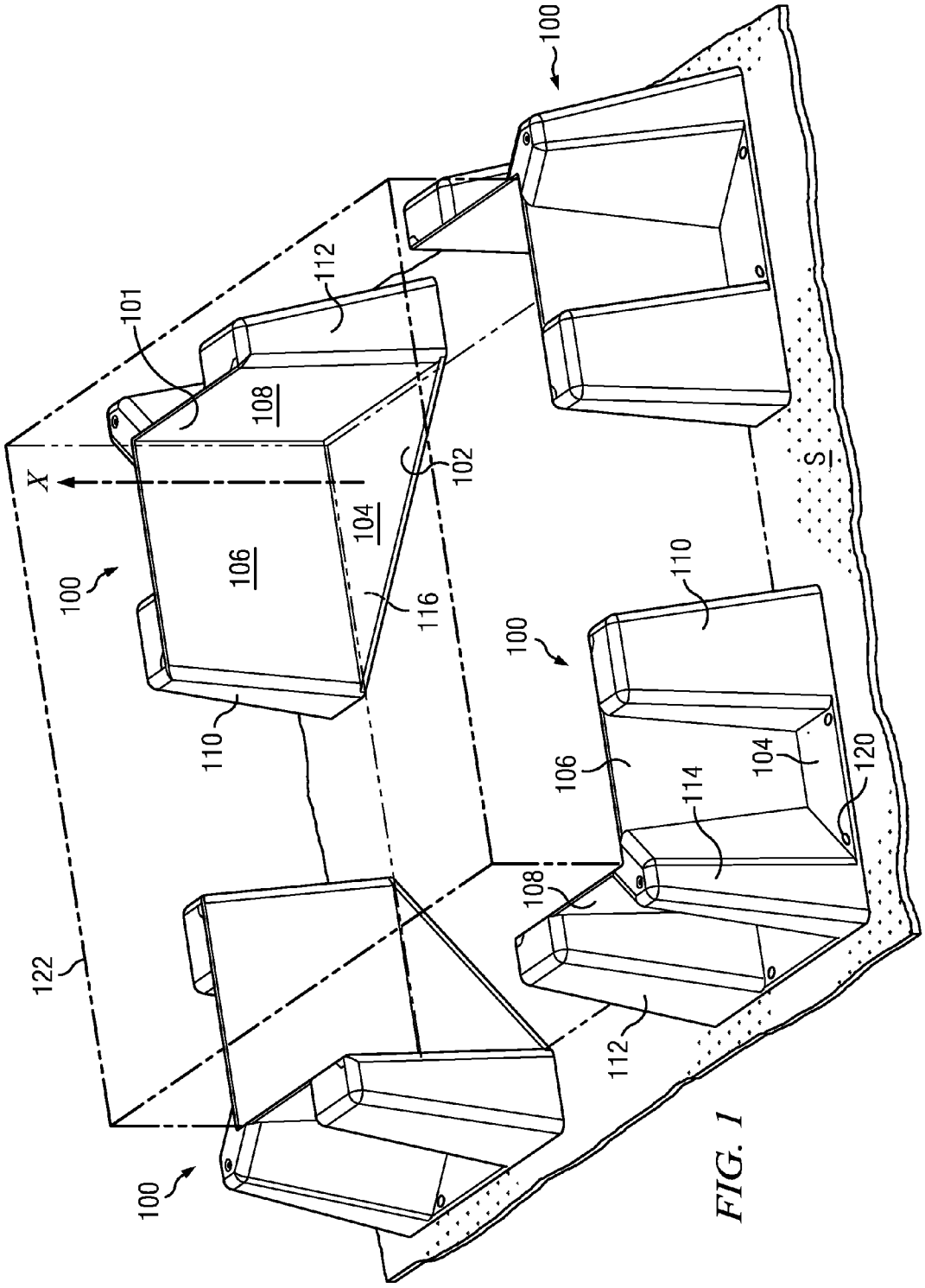
100
101
112
108
X
102
104
106
116
110
S
100
100
110
106
104
114
120
108
122
112
100

FIG. 1

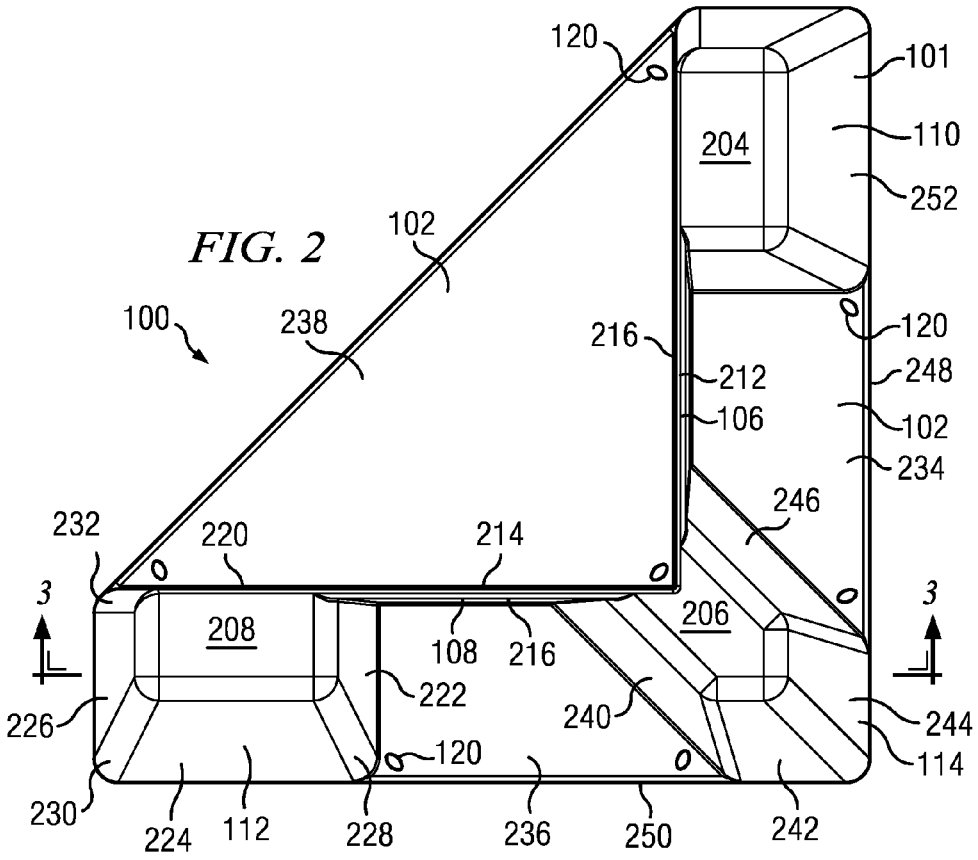
120
101
110
204
252
102
100
238
216
120
248
212
106
102
234
246
232
220
214
3
3
208
206
108
216
222
240
244
226
120
114
230
224
112
228
236
250
242

FIG. 2

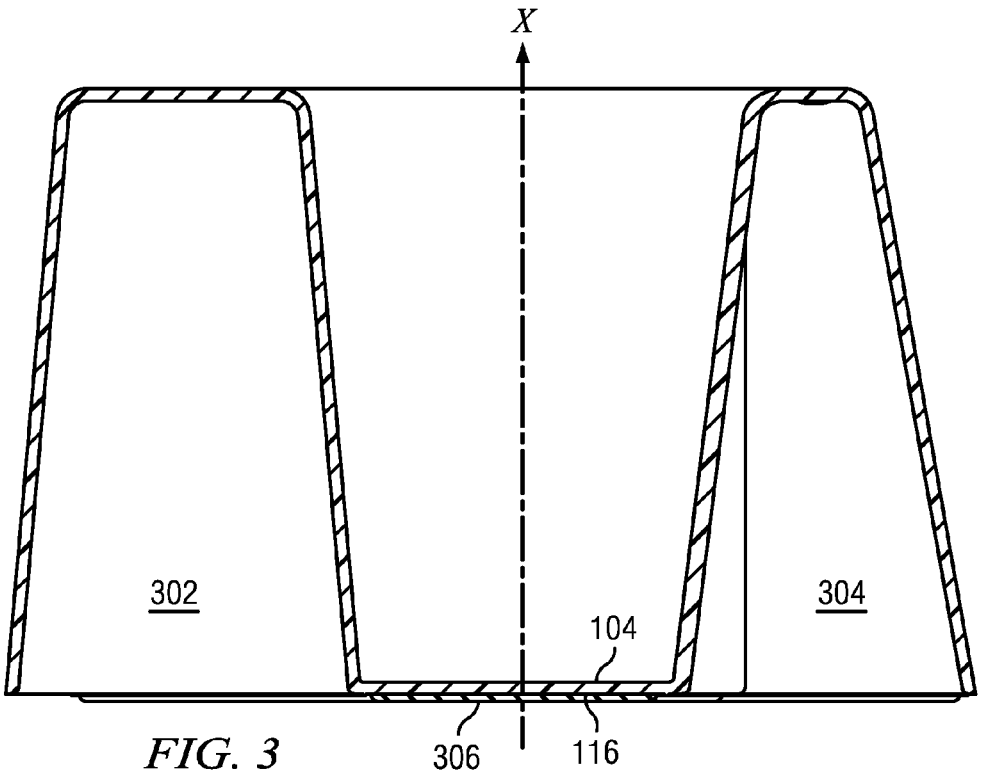
X
302
304
104
306
116

FIG. 3

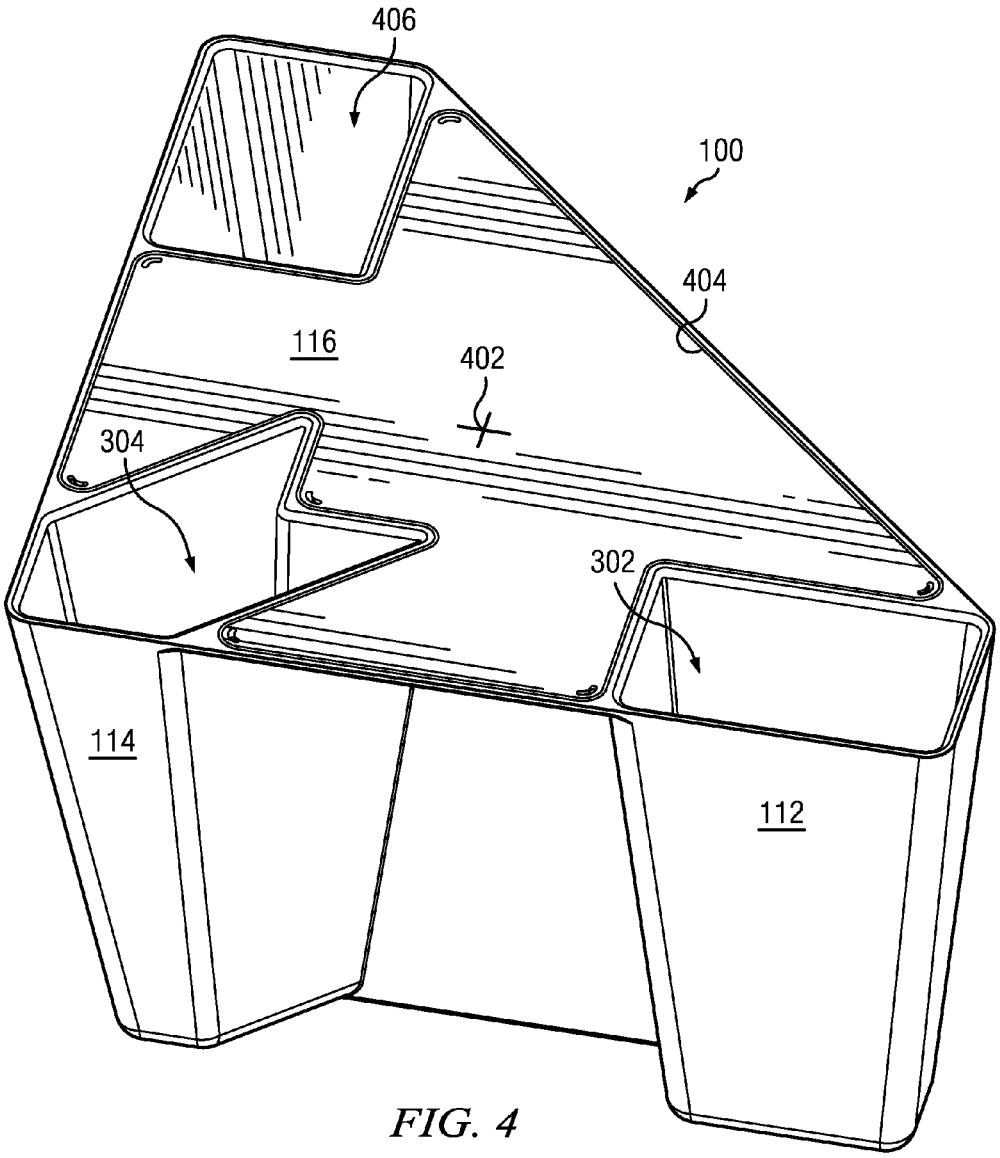

FIG. 4

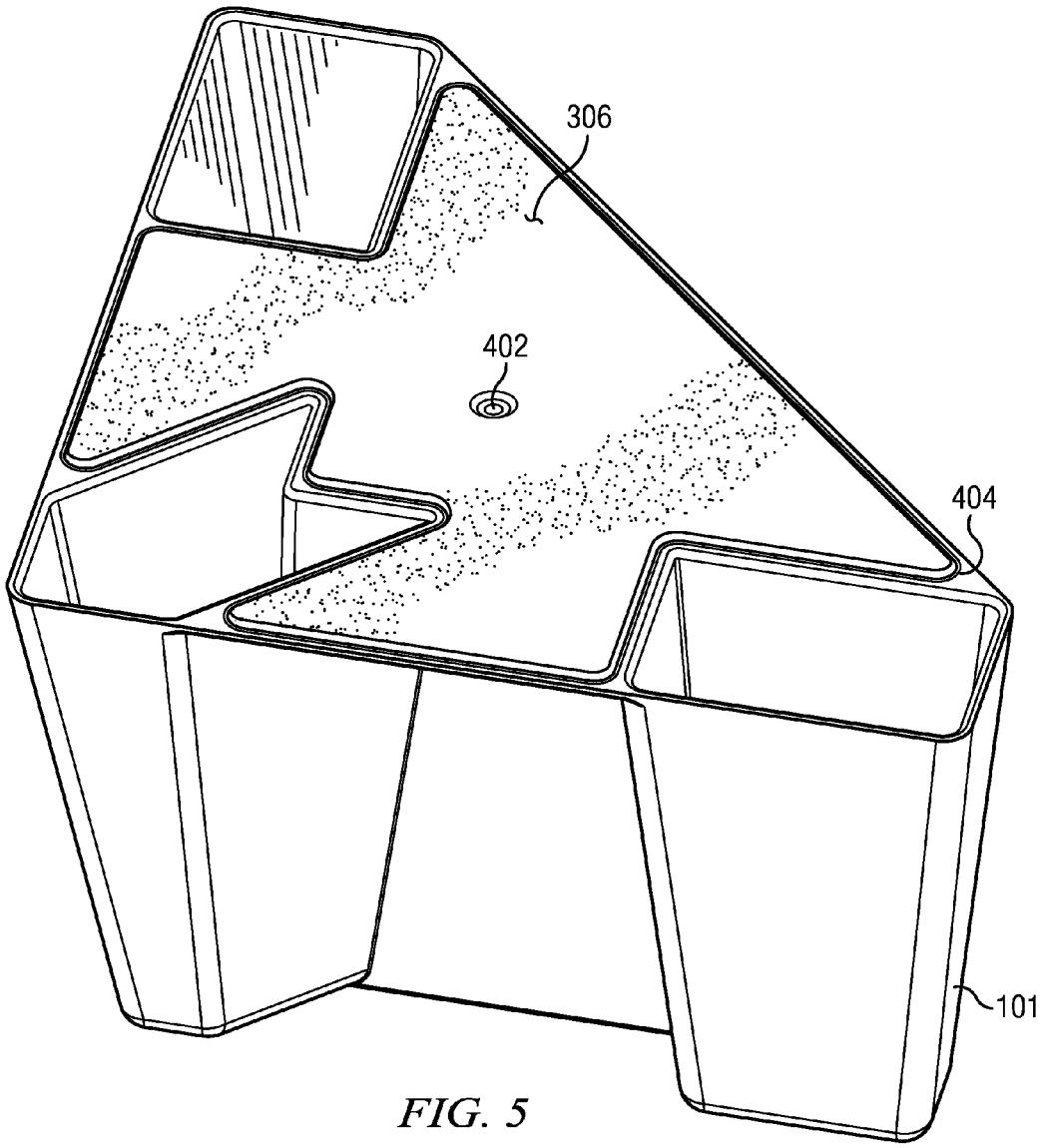

FIG. 5

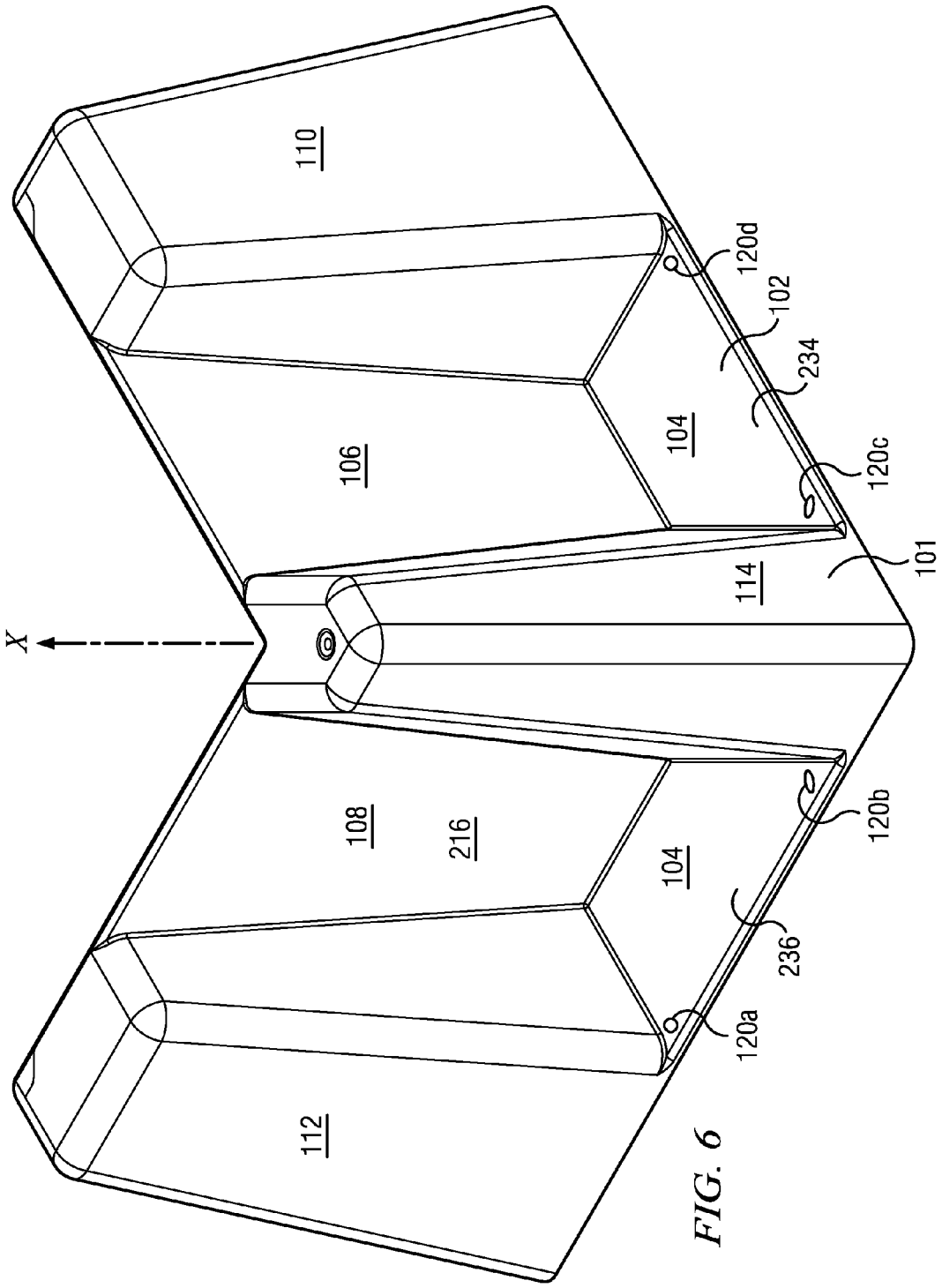
110
120d
102
234
104
106
120c
101
114
X
108
216
104
120b
236
120a
112

FIG. 6

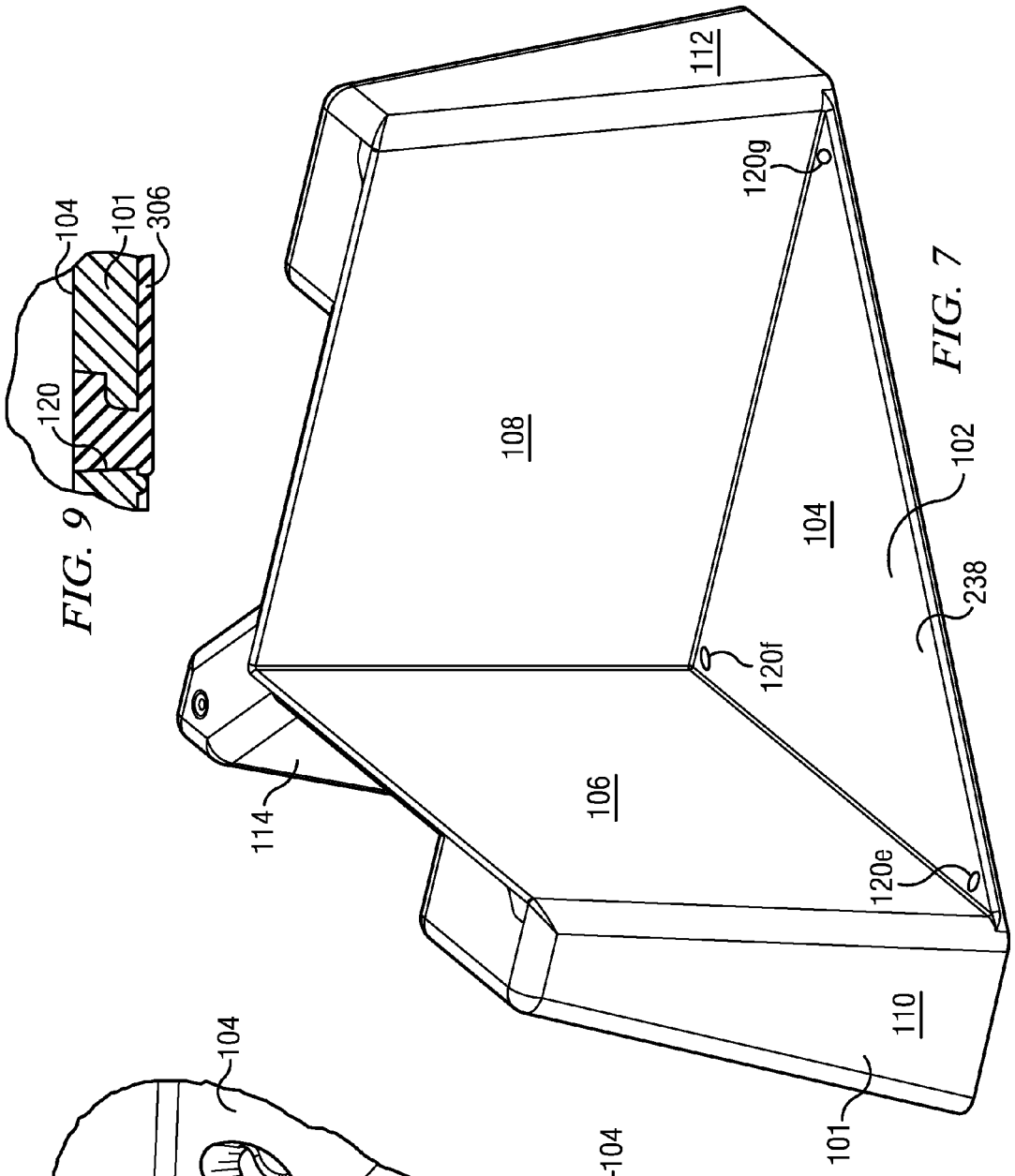

FIG. 7

FIG. 9

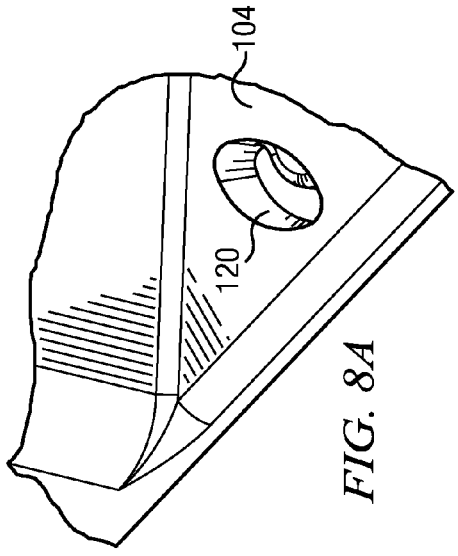

FIG. 8A

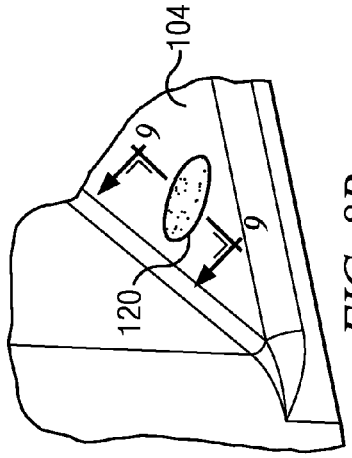

FIG. 8B

STABILIZING CARGO ORGANIZER

BACKGROUND OF THE INVENTION

Vehicles have limited space in which to carry cargo. Most often cargo is situated in trunks, truck beds, and cargo areas. The limited space and the need to optimize the use of that space while transporting multiple items efficiently and safely leads many users to purchase and install various cargo organizers. However, although cargo organizers may inhibit or prevent the cargo from shifting while in transit, most cargo organizers are only partially adjustable allowing the user to have the limited capability of adjusting dividers and pockets rather than the ability to adjust the organizer to fit the varying sizes of the packages or cargo. Cargo organizers on the market cannot be tailored to fit all shapes and sizes of potential cargo—they especially cannot accommodate medium to large cargo or boxes so those items would shift and slide in the vehicle. Furthermore, cargo organizers take up valuable cargo space when not being used.

Thus a need exists for an adjustable cargo stabilizer that can be used to keep large items such as boxes and top heavy items such as packed grocery bags, secure in cargo beds, cargo spaces, or trunks without taking up a lot of space when not in use.

SUMMARY OF THE INVENTION

According to one aspect of the invention, a cargo organizer has an organizer body which is molded from a first polymer. The organizer body has a bottom panel which has an upper surface and lower surface and is disposed substantially at right angles to a vertical axis. Several spaced-apart holes extend from the lower surface of the bottom panel to the upper surface of the bottom panel. A first wall and a second wall are integrally molded with the bottom panel and extend upwardly in parallel to the vertical axis. The first and second walls are disposed at an angle to each other. A friction pad formed of a second polymer is overmolded on the lower surface of the bottom panel. The friction pad extends through the holes on the bottom panel to provide an additional mechanical lock between the friction pad and the organizer body.

According to another aspect of the invention, a cargo organizer has an organizer body molded form a first polymer compound, and has a bottom panel with an upper and lower surface. The bottom panel is disposed at substantially a right angle to a vertical axis. An upstanding first wall is molded with the bottom panel and upwardly extends in parallel to the vertical axis. An upstanding second wall is molded with the bottom panel and upwardly extends in parallel to the vertical axis and at an angle to the first wall. A first pier is integrally molded with and at least partially defines the first wall. The open bottom of the first pier is substantially coplanar with the bottom panel. A second pier which is spaced from the first pier is integrally molded with and at least partially defines the second wall. A friction pad of a second polymer is overmolded on the bottom panel.

According to yet another aspect of the invention, a cargo organizer has an organizer body molded from a first polymer. A bottom panel of the organizer body has a surface area. At least one hollow pier adjoins the bottom panel. The organizer body has a footprint which is equal to the surface area of the bottom panel and the area of the hollow bottom of each of the piers. A friction pad of a second polymer is overmolded on the bottom panel, but is not overmolded on the hollow bottoms of each of the piers.

The present invention provides an advantage over prior cargo organizers because it prevents many different sizes of cargo from shifting. In addition and when not in use, the cargo organizer can be stored and take up minimal space. Furthermore, the friction pad of the cargo organizer will not delaminate.

BRIEF DESCRIPTION OF THE DRAWINGS

Further aspects of the invention and their advantages can be discerned in the following detailed description, in which like characters denote like parts and in which:

FIG. **1** is an isometric view of four stabilizing cargo organizers according to the invention, as assembled around a box that is shown as environmental structure;

FIG. **2** is a plan view of a stabilizing cargo organizer shown in FIG. **1**;

FIG. **3** is sectional view taken substantially along line **3-3** of FIG. **2**;

FIG. **4** is an isometric view of the bottom of the stabilizing cargo organizer shown in FIG. **1**, illustrating the cargo organizer prior to overmolding with a second polymer compound;

FIG. **5** is an isometric view of the bottom of the same stabilizing cargo organizer shown in FIG. **4**, shown after overmolding is complete;

FIG. **6** is an outer isometric view of a corner of the stabilizing cargo organizer;

FIG. **7** is an isometric view looking into a corner formed by the stabilizing cargo organizer;

FIG. **8**A is a detail view, from the top, of a representative through hole of the stabilizing cargo organizer before overmolding;

FIG. **8**B is a detail view, from the top, of a representative through hole of the stabilizing cargo organizer after overmolding; and

FIG. **9** is a sectional view corresponding to a section along line **9-9** of FIG. **8**B.

DETAILED DESCRIPTION

Stabilizing cargo organizers **100** according to the invention can be used to stabilize and organize cargo such as boxes on a surface S which may be a surface in a cargo bed, a cargo space or a trunk of a vehicles. In the exemplary embodiment shown in FIG. **1**, four stabilizing cargo organizers **100** are positioned around a box **122**. A friction pad **306** (See FIGS. **3** and **5**) disposed on the bottom of each cargo organizer **100** prevents movement of the cargo organizers **100** and caged cargo. The heavier the object placed on the cargo organizer **100**, the more force required to move the cargo organizer **100**. The force required to move the cargo organizer **100** is proportional to the weight of the box **122** or cargo times the area of the friction pad **306** times the coefficient of friction of the friction pad **306**.

Referring to FIGS. **2-4**, and **6**, a body **101** of the organizer **100** is molded from a first polymer compound, preferably a rigid polypropylene but may also be formed from polystyrene, polyethylene, polycarbonate or acrylic. The organizer **100** has a bottom panel **102** with an upper surface **104** and a lower surface **116** and is disposed substantially at a right angle to a vertical axis X. Several through holes **120** extend from the upper surface **104** to the lower surface **116**. A first wall **106** is integrally molded with the bottom panel **102** and upwardly extends in parallel to the vertical axis X. A second wall **108** is integrally molded with the bottom panel **102** and upwardly extends in parallel to the vertical axis X. The first and second walls, **106**, **108**, are disposed at a right angle to

each other in the illustrated embodiment. Accordingly, the intersection of the first wall **106**, the second wall **108** and the bottom panel **102** forms a corner and a ledge for the box **122** to be placed upon. In the illustrated embodiment, each corner of the box **122** is placed on the upper surface **104** of the bottom panel **102** of one of the four organizers **100**. In other embodiments, the first and second walls **106**, **108**, may be disposed relative to each other at an angle other than ninety degrees. In addition, in other embodiments the first and second walls **106**, **108**, may not intersect.

The cargo organizer has a first hollow pier **110** which upwardly extends from the bottom panel **102** and is integrally molded with and at least partially defines the first wall **106**. A second hollow pier **112**, which is spaced apart from the first pier **110**, upwardly extends from the bottom panel **102** and is integrally molded with and at least partially defines the second wall **108**. As shown in FIG. **2**, the first and second piers **110**, **112**, have similar shapes which is substantially a frusto-conical rectangular shape. For example, in FIG. **2**, the second pier **108** has four walls, **220**, **222**, **224**, and **226** and three rounded corners **228**, **230**, **232**. An interior wall **220** at least partially defines the second wall **108**. The remaining walls **222**, **224**, **226** angle inward as the second pier **112** extends from the bottom panel **102** to a top pier panel **208** such that the surface area of the top pier panel **208** is smaller than the surface area of the open pier bottom **302** (See FIG. **3**).

FIG. **2** of the illustrated embodiment has a third pier **114**, which is spaced apart from both the first **110** and second **112** piers. The third pier **114** upwardly extends from the bottom panel **102**. The third pier **114** forms a junction between the first and second walls **106**, **108**; in this embodiment the junction is ninety degrees. The two interior walls of the third pier **114** are integrally formed with and at least partially define the first **106** and second **108** walls. The remaining walls, **240**, **242**, **244**, **246** angle inward as the wall extends from the bottom panel **102** to a top pier panel **206**. While the illustrated embodiment has a first pier **110**, second pier **112** and third pier **114**, other embodiments may have no piers or one or two piers. In addition, piers **110**, **112**, **114** may have shapes other than the shape illustrated. For example, potential shapes for piers **110**, **112**, **114** may include pyramidal, conical, frusto-conical or rectangular prism shapes.

As shown in FIG. **2**, the first wall **106** has an interior side **210** and an exterior side **212** opposed to the interior side. Likewise the second wall **108** has an interior side **214** and an exterior side **216** opposed to the interior side **214**. In the illustrated embodiment, the bottom panel **102** extends laterally beyond both the interior **210**, **214** and exterior **212**, **216** sides of the first and second walls **106**, **108**. In some embodiments the bottom panel may laterally extend beyond both the interior **210**, **214** and exterior **212**, **216** of only one of the first or second walls **106**, **108**. In still other embodiments, an outer margin of the bottom panel **248**, **250** may be continuous with either the lower end of the outer wall **252** of the first pier **110**, the lower end of the outer wall **224** of the second pier **112** or both.

FIG. **3** shows a cross section of the organizer **100** where the hollow third pier **114** and hollow second pier **112** are visible. A hollow bottom **304** of the third pier **114** and a hollow bottom **302** of the second pier **112** are coplanar with the lower surface **116** of the bottom panel **102**. The first pier **110** has a hollow bottom that is also coplanar with the lower surface **116** of the bottom panel **102**. A friction pad **306** formed of a second polymer compound which, as molded, has a higher coefficient of friction, relative to surface S, than the first polymer compound, is overmolded on the lower surface **116** of the bottom panel **102** but is not overmolded over the hollow bottoms of the first, second, or third piers **110**, **112**, **114**. As noted above, when a heavy object is placed on the cargo organizer **100**, the area of the friction pad **306** and the coefficient of friction of the friction pad **306** combined with the weight of the cargo, make the cargo organizer **100** more resistant to movement. The heavier the object placed on the cargo organizer **100**, the greater the resistance to movement. The friction pad **306** is molded to extend into the through holes **120** and is preferably formed of a thermoplastic elastomer (TPE) but may also be formed from any material which has a high coefficient of friction relative to surface S. The material of friction pad **306** preferably is selected to grip a surface S made out of a TPE or a rubber, such as the upper surface of a cargo liner.

FIG. **4** shows the lower surface **116** of the bottom panel **102** before the friction pad **306** is overmolded. More than one through hole **120** are disposed along the perimeter of the bottom panel **102**. The through holes **120** preferably are spaced remotely from a central fill point or gate **402**. Since they are close to an end-of-fill limit of the second polymer compound, which will spread outward from gate location **402** radially to holes **120**, the holes **120** permit gas trapped in the overmold process to escape to the upper surface **104** of the bottom panel **102** and dissipate into the air. The shape of the through holes **120** changes from a crescent on the lower surface **116** of the bottom panel **102** to an oval on the upper surface **104** of the bottom panel **102** (See FIGS. **1** and **2**), expanding in area as one proceeds upwardly. Therefore, in addition to venting gas, the through holes **120** help form a mechanical lock or attachment of the overmolded friction pad **306** to the lower surface **116** of the bottom panel **102**.

A crush bead **404** is disposed on the lower surface **116** of the bottom panel **102** near its lateral boundary. The crush bead **404** is a smooth endless horizontal surface that downwardly depends from the lower surface **116** of the bottom panel **102**. The crush bead **404** is used as a shut off surface to prevent the flashing of the second polymer compound during a "second shot" or overmolding step of fabrication.

FIG. **5** shows the lower surface **116** of the bottom panel **102** after the overmolding process has occurred. Here, the friction pad **306** has been overmolded onto the lower surface **116** of the bottom panel **102** within the perimeter of the crush bead **404**.

FIGS. **6** and **7** show different views of the organizer **100** after the friction pad **306** is overmolded onto body **101**. The second polymer of the friction pad **306** is visible in the through holes **120** with the top of the polymer in the through hole **120** being coplanar with the upper surface **104** of the bottom panel **102**. In the illustrated embodiment two through holes, **120***c*, **120***d*, are between the first and third piers **110**, **114** and the exterior **212** of the first wall **106**, on outer trapezoidal shelf **234**, near the lateral outer periphery of bottom panel **102**. Through hole **120***c* is near the outer periphery of pier **114** and hole **120***d* is near the outer periphery of pier **110**. There are two through holes **120***a*, **120***b*, between the second and third piers **112**, **114**, and the exterior **216** of the second wall **108** on outer trapezoidal shelf **236**, near the lateral outer periphery of bottom panel **102**. Through hole **120***a* is near the outer periphery of pier **112** and hole **120***b* is near the outer periphery of pier **114**. In addition, as shown on FIG. **7**, through hole **120***e* is disposed on the upper surface **104** of the bottom panel **102**, on the inner triangular shelf **238** near the outer periphery of panel **102** and wall **106**. Through hole **120***f* is disposed on the upper surface **104** of the bottom panel **102**, on the inner triangular shelf **238**, near the junction of walls **106** and **108**. Through hole **120***g* is disposed on the upper surface **104** of the bottom panel **102**, on the inner triangular

shelf **238**, near the outer periphery of panel **102** and wall **108**. Other embodiments may have more or fewer through holes **120** which may be disposed in different locations.

As shown in FIGS. **4**, **8**A and **9** and discussed above, the through holes **120** on the lower surface **116** of the bottom panel **102** have a crescent shape. However, the through holes **120** on the upper surface **104** of the bottom panel **102** have an oval shape. FIG. **8**A shows the transition of the through hole **120** from oval on the upper surface **104** of the bottom panel **102** to the crescent shape on the lower surface **116** of the bottom panel **102**. (See FIG. **4**) FIG. **8**B shows the through hole **120** filled with the friction pad material **306**. FIG. **9** shows that the through holes transition from the crescent on the lower surface **116** of the bottom panel **102** to the oval on the upper surface **104** of the bottom panel **102**. The changing shape and expanding area of the through hole **120** as a function of distance from the lower surface allows for an additional mechanical lock of the friction pad **306** to the bottom panel **102**. Other embodiments may have through holes with different shapes with the surface area of the through hole **120** on the upper surface **104** of the bottom panel **102** being larger than the surface area of the through hole **120** on the lower surface **116** of the bottom panel **102**.

In the exemplar embodiment shown in FIGS. **2**, **6**-**7**, the distance between the third pier **114** and the outermost edge of the first pier **110** is approximately eight inches. Likewise, the distance between the center of third pier **114** and the outermost edge of the second pier **112** is approximately eight inches. The height of the first, second and third piers, **110**, **112**, **114**, is approximately five inches. In FIG. **3**, the friction pad **306** extends approximately 0.060 inch from the lower surface **116** of the bottom panel **102**.

In summary, a cargo organizer has been shown and described which can be used for many different sized packages and boxes and which have a friction pad to prevent cargo from moving while being transported in a vehicle. While illustrated embodiments of the present invention have been described and illustrated in the appended drawings, the present invention is not limited thereto but only by the scope and spirit of the appended claims.

We claim:

1. A cargo organizer for stabilizing cargo in a vehicle, the cargo organizer comprising:

an organizer body molded from a first polymer compound, the organizer body having a bottom panel with an upper surface and a lower surface, the bottom panel disposed substantially at right angles to a vertical axis, a plurality of spaced-apart holes extending from the upper surface to the lower surface;

an upstanding first wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis;

an upstanding second wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis, the second wall disposed at an angle to the first wall; and

a friction pad formed of a second polymer compound having a higher coefficient of friction than the first polymer compound, the friction pad overmolded on the lower surface of the bottom panel and extending through said holes on the bottom panel so as to provide a mechanical lock of the friction pad to the organizer body.

2. The cargo organizer of claim **1**, wherein the first wall is disposed at a right angle to the second wall.

3. The cargo organizer of claim **1**, wherein the first wall is joined to the second wall to form a three-sided corner with the upper surface of the bottom panel.

4. The cargo organizer of claim **1**, wherein each of the plurality of holes has a top surface area at the upper surface of the bottom panel and a bottom surface area at the lower surface of the bottom panel, the bottom surface area being less than the top surface area.

5. The cargo organizer of claim **1**, wherein each of the first and second walls have an interior side and an exterior side opposed to the interior side, the bottom panel laterally extending beyond both of the interior and exterior sides of at least one of the first and second walls.

6. The cargo organizer of claim **5**, wherein the bottom panel laterally extends beyond both of the interior and exterior sides of both the first and second walls.

7. The cargo organizer of claim **5**, wherein at least one of the plurality of holes is disposed near the interior side of the first wall and remote from the exterior side of the first wall, at least one of the plurality of holes is disposed near the exterior side of the first wall and remote from the interior side of the first wall, at least one of the plurality of holes is disposed near the interior side of the second wall and remote from the exterior side of the second wall, and at least one of the plurality of holes is disposed near the exterior side of the second wall and remote from the interior side of the second wall.

8. The cargo organizer of claim **1**, wherein a hollow first pier extends upwardly from the upper surface of the bottom panel.

9. The cargo organizer of claim **8**, wherein a hollow second pier extends upwardly from the upper surface of the bottom panel.

10. The cargo organizer of claim **9**, wherein a hollow third pier extends upwardly from the upper surface of the bottom panel.

11. A cargo organizer for stabilizing cargo in a vehicle, the cargo organizer comprising:

an organizer body molded from a first polymer compound, the organizer body having a bottom panel with an upper surface and a lower surface, the bottom panel disposed substantially at a right angle to a vertical axis;

an upstanding first wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis;

an upstanding second wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis and at an angle to the first wall;

an upwardly extending, hollow first pier integrally molded with and at least partially defining the first wall, an open bottom of the first pier being substantially coplanar with the bottom panel;

an upwardly extending, hollow second pier integrally molded with and at least partially defining the second wall, an open bottom of the second pier being substantially coplanar with the bottom panel, the second pier being spaced from the first pier; and

a friction pad overmolded on the bottom panel to be coextensive with the lower surface of the bottom panel, the friction pad formed from a second polymer compound having a higher coefficient of friction than the first polymer compound, the friction pad not extending to cover the open bottoms of the first and second piers;

wherein each of the first and second walls have an interior side and an exterior side opposed to the interior side, the bottom panel laterally extending beyond both the interior and exterior sides of the first and second walls, the first pier having at least one outer wall spaced from the first wall, the second pier having at least one outer wall spaced from the second wall, the first pier outer walls

terminating at the open bottom of the first pier, the second pier outer wall terminating at the open bottom of the second pier.

12. The cargo organizer of claim **11**, wherein the outer walls of the first and second piers are sloped.

13. A cargo organizer for stabilizing cargo in a vehicle, the cargo organizer comprising:

an organizer body molded from a first polymer compound, the organizer body having a bottom panel with an upper surface and a lower surface, the bottom panel disposed substantially at a right angle to a vertical axis;

an upstanding first wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis;

an upstanding second wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis and at an angle to the first wall;

an upwardly extending, hollow first pier integrally molded with and at least partially defining the first wall, an open bottom of the first pier being substantially coplanar with the bottom panel;

an upwardly extending, hollow second pier integrally molded with and at least partially defining the second wall, an open bottom of the second pier being substantially coplanar with the bottom panel, the second pier being spaced from the first pier; and

a friction pad overmolded on the bottom panel to be coextensive with the lower surface of the bottom panel, the friction pad formed from a second polymer compound having a higher coefficient of friction than the first polymer compound, the friction pad not extending to cover the open bottoms of the first and second piers;

further comprising an upwardly extending, hollow third pier integrally molded with and at least partially defining the first and second walls, an open bottom of the third pier being substantially coplanar with the bottom panel, the third pier being spaced from the first and second piers.

14. The cargo organizer of claim **13**, wherein the third pier forms a junction between the first and second walls.

15. The cargo organizer of claim **13**, wherein the third pier having at least one outer wall spaced from the first and second walls, the at least one outer wall of the third pier being sloped.

16. A cargo organizer for stabilizing cargo in a vehicle, the cargo organizer comprising:

an organizer body molded from a first polymer compound, the organizer body having a bottom panel with an upper surface and a lower surface, the bottom panel disposed substantially at a right angle to a vertical axis;

an upstanding first wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis;

an upstanding second wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis and at an angle to the first wall;

an upwardly extending, hollow first pier integrally molded with and at least partially defining the first wall, an open bottom of the first pier being substantially coplanar with the bottom panel;

an upwardly extending, hollow second pier integrally molded with and at least partially defining the second wall, an open bottom of the second pier being substantially coplanar with the bottom panel, the second pier being spaced from the first pier; and

a friction pad overmolded on the bottom panel to be coextensive with the lower surface of the bottom panel, the friction pad formed from a second polymer compound having a higher coefficient of friction than the first polymer compound, the friction pad not extending to cover the open bottoms of the first and second piers;

wherein a plurality of holes extend from the upper surface to the lower surface of the bottom panel, the friction pad molded to extend into the holes.

17. A cargo organizer for stabilizing cargo in a vehicle, the cargo organizer comprising:

an organizer body molded from a first polymer compound, the organizer body having a bottom panel with an upper surface and a lower surface, the bottom panel disposed substantially at a right angle to a vertical axis;

an upstanding first wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis;

an upstanding second wall integrally molded with the bottom panel and upwardly extending in parallel to the vertical axis and at an angle to the first wall;

an upwardly extending, hollow first pier integrally molded with and at least partially defining the first wall, an open bottom of the first pier being substantially coplanar with the bottom panel;

an upwardly extending, hollow second pier integrally molded with and at least partially defining the second wall, an open bottom of the second pier being substantially coplanar with the bottom panel, the second pier being spaced from the first pier; and

a friction pad overmolded on the bottom panel to be coextensive with the lower surface of the bottom panel, the friction pad formed from a second polymer compound having a higher coefficient of friction than the first polymer compound, the friction pad not extending to cover the open bottoms of the first and second piers;

wherein the first pier has a first pier outer wall with a lower end, the first pier outer wall having a lower end, the second pier having a second pier outer wall, the bottom panel having an outer margin, the outer margin being continuous with at least one of the first pier outer wall lower end and the second pier outer wall lower end.

18. The cargo organizer of claim **17**, wherein the outer margin of the bottom panel is continuous with the lower ends of both of the first pier outer wall and second pier outer wall.

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